ASSOCIATION OF KNOWLEDGE ABOUT COVID 19 WITH AGE, EDUCATIONAL QUALIFICATION AND FAMILY INCOME AMONG ADULTS IN TAMILNADU

Dr. Vajiravelu Suganthi[1], Panneerselvam Periasamy*[1], Sasikala Gunasekaran[2], Dr.Arivudainambi Seenichamy[3], Perumal Vijayaraman Kiruthiga[3], Arumugam Chandrabose[4]

[1]Department of Physiology, Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem, Tamilnadu.
[2]Department of Psychiatric Nursing, Vinayaka Missions Annapoorana College of Nursing, Salem,
[3]Regional Medical Research Center (ICMR), WHO reference center for Leptospirosis, Port Blair-744103, Andaman and Nicobar Islands.
[4]Department of Physiology, Government Erode Medical College, Perundurai, Erode, Tamilnadu.

*pannphysio@gmail.com

Abstract

Coronavirus disease 2019 (COVID-19) is an emerging respiratory infection caused by a novel corona virus called Severe Acute Respiratory Syndrome corona virus 2 (SARS-CoV-2). The symptoms of COVID-19 illness range from very mild fever and cough to severe pneumonia, severe acute respiratory syndrome with a mortality rate around 4%. Assessment of the knowledge and information sources of COVID-19 infection among adults. A total of 560 participants were included in the study, with a gender ratio of 3:1 (females: males). 55.5% of people Age between 30-40 Years, 64% of school educated, 70.6% of unskilled workers and 66.7% Upper Class people are having Inadequate knowledge about Covid 19. Association of knowledge with age (p<0.05) educational qualification (p<0.01), employment status and monthly family income (p<0.001) are significant. Policymakers must implement strategies to keep the common people informed about the emerging public health emergencies. People should be properly guided to use reliable sources of information such as government websites and scientific literature for up-to-date information.

Keywords: COVID-191, Knowledge2, Family income3, educational qualification4, Tamilnadu5.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an emerging respiratory infection caused by a novel corona virus called Severe Acute Respiratory Syndrome corona virus 2 (SARS-CoV-2)[1, 2]. The SARS-CoV-2 virus is similar to Middle East Respiratory Syndrome corona virus (MERS-CoV) and Severe Acute Respiratory Syndrome corona virus (SARS CoV), which have their origins in bats. The COVID-19 disease was detected initially in late December 2019 in Wuhan, Hubei Province, China, and spread worldwide 2 months later.[3]

About 200 countries over the entire world have reported different numbers of cases; however, the disease has drastically expanded in the United States, Spain, Italy, Germany, France, China, Iran, the United Kingdom, India and Turkey. Globally, as on 3 August 2021, there have been 198,778,175 confirmed cases of COVID-19, including 4,235,559 deaths, reported to WHO[4]. In India 3,13,43,375 COVID-19-infected cases have been confirmed and 4,25,757 people have died with COVID-19 as on 04 August 2021[5]. Tamilnadu 25,31,293 COVID-19-infected cases have been confirmed and 34,159 people have died with COVID-19 as on 04 August 2021[5]. The symptoms of COVID-19 illness range from very mild (fever and respiratory symptoms such as cough and shortness of breath) to severe (pneumonia, severe acute respiratory syndrome and kidney failure) with a mortality rate around 4%. Elderly persons and those suffering from co-morbidities like heart disease, lung disease and diabetes, are at higher risk of developing severe COVID-19 illness[6,7].

As a response to this serious global public threat, the WHO characterized the COVID-19 outbreak as a pandemic on March 11, 2020, since the number of COVID-19 cases outside China had increased by 13-fold, and the number of affected countries had increased by 3-fold [8]. A limited number of in vitro and clinical studies have reported that some medications such as chloroquine, hydroxychloroquine, remdesivir and azithromycin have the potential to reduce the duration and symptoms of COVID-19 infection[9,10]. Unfortunately, a curative treatment or vaccine for the SARSCoV- 2 virus has not been developed yet, and the available medical interventions are supportive only.

COVID-19 disease has negatively affected global economics, and this has included the Indian. Furthermore, many healthcare systems have collapsed or nearly collapsed due to COVID-19 [7,8]. Therefore, it is very important to flatten the shape of the crest in case numbers as much as possible while communities experience an outbreak of COVID-19 to reduce the burden on the healthcare system. In response to lessons learnt from the previous pandemic (H1N1) 2009 virus and SARS in 2003, management measures should be considered. These measures include prevention of the infection within animals, its transmission from animals to humans, and its transmission among humans[11]. The latter is highly affected by promoting good hygienic practices among people to include enhancement of hand washing, use of personal protective equipment and minimization of hand-to-face contact[12]. During the current pandemic, most countries are responding to contain the COVID-19 pandemic by retarding infection spread using different strategies such as contact tracing and self-quarantine, arrangement of health system infrastructures to treat severely infected patients who need isolation, oxygen therapy or mechanical ventilation, reducing, or banning events involving mass gatherings, and encouraging people to apply hygienic health measures, such as physical distancing, respiratory etiquette and frequent hand washing. The latter strategy requires a high level of knowledge about COVID-19 fostering attitudes among people to recognize and practice these measures properly. In the absence of COVID-19 treatment, the application of protective measures will potentially prevent the population from acquiring the disease and reduce disease dissemination [13]. This study aimed to assess the knowledge of COVID-19 infection among adults and association between knowledge about COVID 19 with Age, Educational qualification and Income among adults. This will constitute a general reference to guide the local authorities in planning the required educational interventions.

MATERIAL AND METHODS

A cross-sectional study design was employed to analyse the knowledge and sources of information related to COVID-19 among the

participants. The study sample consisted of adults in Tamilnadu. Data was collected using an anonymous online questionnaire survey developed in Google forms. Participants were invited to complete the online survey through Facebook and WhatsApp groups in the month of July2020, given the complete lockdown imposed by the State government.

The survey questionnaire was prepared in English, and was divided into 3 sections. The completion of the online survey took about 8–10min and included multiple choice questions, or yes/no/ I don't know options within different sections.

The first part of the questionnaire included an introduction rationalizing the objectives of the study and highlighting that participation in the study is voluntary. Informed consent was included as part of the questionnaire. Also, confidentiality of their responses was assured to the participants. The second part of the questionnaire was intended to determine the socio demographic details of the participants' including gender, age, place of residence, educational level, employment status, marital status, and monthly family income The third part measured the knowledge and sources used to obtain information related to COVID-19, such as its sources, incubation period, mortality rate, transmission, symptoms, and complications.

Calculation of Knowledge Score:

A system of scoring was used to measure the level of participants' knowledge by rewarding

a score of 1 for 'Yes' and 0 for a 'No'/ 'I don't know' answer. The total score for knowledge was converted to percentage, over a range of 0 to 100%. The knowledge scores were classified as inadequate (≤60%), moderate (60.01–80%), and adequate levels of knowledge (≥80.01-100.00%). The results of participants' knowledge on COVID- 19 and sources of information will be expressed as frequencies and percentages. Demographic variables in categories were given in frequencies with their percentages. Association between demographic variables and level of knowledge scores was analysed using Pearson's chi square test. Pie diagram, Simple bar diagram and multiple bar diagram were used to represent the data. A p-value of ≤0.05 was considered statistically significant, and two-tailed tests were used for significance testing. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS, version 22) and STATA (version 12) software. The Ethical Approval for the research work was procured from the Institutional Ethics Committee.

RESULTS

A total of 560 participants were included in the study, with a gender ratio of 3:1 (females: males). As shown in Table 1, females showed an active participation in the survey. The mean age of the study participants is 26.91+8.59 years. Male mean age is 28.83+9.63 and female mean age is 26.25+8.12 years. Graduation was the highest educational qualification among most of the participants, followed by diploma course, as shown in Table 1.

As shown in Figure 1, nearly 57% of the respondents had inadequate level of knowledge; 36.25% had moderate level of knowledge, and only 7.32 % had adequate level of knowledge on COVID-19 related information.

General awareness related to COVID-19 among the participants

Nearly all the participants, believed that the COVID-19 infection was caused by a virus. Moreover, 81.07% of the participants believed that SARS CoV-2, the causative agent of COVID-19 to be new member of the Coronavirus family. 62.14 % of the respondents believed that the incubation period was less than 14 days, however, 30.71% reported the opposite, and nearly 7% weren't aware of it. Among the participants, there was a mixed opinion regarding the mortality rate of COVID-19.

Knowledge of Potential Sources of COVID-19 Transmission among the participants

Participants were split in thought of considering transmission of COVID-19 through consumption of contaminated foods and the sexual route, however, majority of them believed that activities like coughing and sneezing (96.07%), kissing and shaking hands (89.64%) , use of fomites (85.71%) and exposure to contaminated surfaces (86.43%) would result in contracting the disease.

Interestingly, many of the respondents' regard on airborne transmission of infected droplets as a potential source for COVID-19 infection.

Knowledge on Symptoms and Complications related to COVID-19

Nearly 95% of the participants believed that people with co-morbidities are likely to contract the disease and develop further complications related to the COVID-19 infection. Also, majority of them perceived the extremities of age, children less than 5 years of age and the elderly, to be the vulnerable group of population.

Knowledge on Symptoms and Complications of COVID-19 among the participants

Greater number of participants counted upon fever (98.21%), dry cough (90.71%), sore throat (97.14%), breathlessness (97.86%), myalgia (70.36%) as the symptoms of the COVID-19 infection. Interestingly, more than half of the participants did not believe blurred vision (54.64%) and skin rashes (56.07%) to be symptoms of COVID-19.

Alternatively, they were split in contemplating illnesses such as diarrhoea, vomiting, sepsis, neuropathy, hyperglycaemia with regard to the COVID-19 infection. Pneumonia (81.79%), bronchitis (78.43%), multi-organ failure (48.21%) and respiratory failure leading to death (93.57%) were regarded to be the complications related to the coronavirus disease.

Participants belonging to the age category of more than 40 years had apprehended adequate amount of knowledge. Adequate amount of knowledge was more evident in participants belonging to the age category of more than 40 years (Figure 2), those with graduate degrees (Figure 3), home makers and those belonging to Lower middle class (Figure 4).

However, knowledge inadequacy was maximum in age category of 30 to 40 years, people with high school qualification and upper-class category.

Discussion

The Coronavirus Disease caused by SARS-CoV2 is an infectious disease affecting humans. The global pandemic of COVID-19 has been a topic of conversation around the world lately. The most preliminary step to prevent and control the disease transmission is to have a well-informed knowledge about it[14]. So, this descriptive cross-sectional study was intended to assess the knowledge related to COVID-19 and various precautionary measures adopted by the general public in Tamilnadu[15].

It has been inferred from the survey responses that more than half of the participants (56.43%) do not have adequate knowledge concerning the COVID-19 infection, however, significant levels of precautionary measures have been adopted among them. This insufficiency in knowledge could be attributed to the early phase of virus transmission in Tamilnadu[16]. However, participants' put to use various preventive measures rooting to the higher educational qualification in many of them (93.04%). This is supported by the statistical significance between

the knowledge score and educational qualification.

Nearly 43% revealed usage of Internet and social media platforms as reliable sources to gather information about COVID-19. This is in accordance with a similar study conducted among medical students in Jordan to assess the knowledge, attitudes and precautionary measures where 83.4% used online resources to obtain information on COVID-19 [17,18]. This should alert the policymakers to ensure that the information in online resources should be of certain quality, to avoid misconceptions. On the contrary, the data on government websites and information in scientific literature are often overlooked.

Zhou et al. concluded through his study that mass media can play an important role in mitigating disease spread during the initial stages of an outbreak. According to the study, peak time could be delayed and peak size could be reduced provided improvements in response rate of the media reporting to the severity of COVID-19 or the response rates of the public awareness to the media reports.[19]

In this study, the commonly perceived routes of disease transmission among the participants were inhalation of infected droplets, exposure to contaminated surfaces and close contact with infected cases. Yet, 73.93% seemed to consider airborne transmission of the COVID-19 infection, probably due to a confusion between airborne and respiratory droplets.[20,21] A recent distinction has currently been adopted by the WHO, which defines respiratory droplets as particles with >5-10 µm in diameter, and airborne transmission for droplet nuclei which are particles <5 µm in diameter. The overall attitude towards COVID-19 among the

participants was remarkable. Based on the questionnaire responses, most of the participants agreed upon isolation and emergency treatment for confirmed cases. Majority of them (69.64%) had an optimistic attitude in regard that the patients would recover completely[22.]

Most of the participants took safety measures to avoid contamination by COVID-19. This could primarily be attributed to the vast broadcasting by the government and mass media like TV, radio, newspapers, magazines, to bring to the notice of the general public[23].

It is worth mentioning that adequate levels of knowledge were perceived more in men, unmarried participants, medical students, rural areas and those belonging to lower middle class.

Conclusion

To the best of our knowledge, it is one of the first of its kind of study conducted in Tamilnadu to examine the knowledge and information sources about COVID-19 among the students and general population. The non-probability sampling technique and the limited sample size fails to represent the entire population. Nevertheless, compared to the most recent population statistics of Tamilnadu [censusindia.gov.in] , the study sample was over representative of women and population with age less than 20 years. Another limitation is that the study was a web-based survey, given the times of pandemic. The data presented in the study was self-reported by the participants, therefore, subject to recall bias. Despite these limitations, our study provides valuable information about the knowledge and perceptions concerning among the general public.

Overall, the study population unexpectedly showed inadequate levels of knowledge regarding COVID-19, but reported good preventive measures. Policymakers must implement strategies to keep the common people informed about the emerging public health emergencies. People should be properly guided to use reliable sources of information such as government websites and scientific literature for up-to-date information. The findings of the study indicate the importance of improving residents' knowledge via health education, specifically targeting certain demographic groups like females and persons with a low educational qualification.

REFERENCES

1. CDC. Coronavirus (COVID-19). (2020). Available online at: https://doi.org/10.1016/S0140-6736(20)30673-5 (accessed April 8, 2020).doi: 10.1016/S0140-6736(20)30673-5

2. Gao J, Tian Z, Yang X. Breakthrough: chloroquine phosphate has shown apparent efficacy in treatment of COVID-19 associated pneumonia in clinical studies. Biosci Trends. (2020) 14:72–3. doi: 10.5582/bst.2020.01047

3. WHO. Coronavirus Disease (COVID-19) Pandemic. (2020). Available online at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019 (accessed May 7, 2020).

4. WHO Coronavirus (COVID-19) Dashboard https://covid19.who.int/

5. Ministry of Health and Family Welfare Govenment of India https://www.mohfw.gov.in/

6. Gautret P, Lagier J-C, Parola P, Hoang V, Meddeb L, Mailhe M, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-results of an open-label non-randomized clinical trial. Int JAntimicrob Agents.doi: 10.1016/j.ijantimicag.2020.105949.

7. Armocida B, Formenti B, Ussai S, Palestra F, Missoni E. The Italian health system and the COVID-19 challenge. Lancet Public Health. 5:E253. (2020) doi: 10.1016/S2468-2667(20)30074-8.

8. Gonzalez RI, Munoz F, Moya PS, Kiwi M. Is a COVID19 quarantine justified in Chile or USA right now? (2020). arXiv:2003.10879.doi: 10.1101/2020.03.23.20042002

9. Rewar S, Mirdha D, Rewar P. Treatment and prevention of pandemic H1N1 influenza. Ann Glob Health. (2015) 81:645–53.doi: 10.1016/j.aogh.2015.08.014

10. WHO. Chapter 5: SARS: Lessons From a New Disease. (2003). Available online at: https://www.who.int/whr/2003/chapter5/en/index5.html (accessed May 7,2020).Pappaioanou M, Gramer M. Lessons from pandemic H1N1 2009 to improve prevention, detection, and response to influenza pandemics from a One Health

perspective. ILAR J. (2010) 51:268–80. doi: 10.1093/ilar.51.3.268

11. Bedford J, Enria D, Giesecke J, Heymann DL, Ihekweazu C, Kobinger G, et al.COVID-19: towards controlling of a pandemic. Lancet. (2020) 395:1015–8.

12. Maffetone PB, Laursen PB. The perfect storm: COVID-19 pandemic meets overfat pandemic. Front. Public Health. (2020) 8:135. doi: 10.3389/fpubh.2020.00135

13. Raosoft Inc. RaoSoft Sample Size Calculator. (2004). Available online at: http://www.raosoft.com/samplesize.html (accessed March 18, 2020).

14. Alzoubi H, Alnawaiseh N, Al-Mnayyis A, Abu-Lubada M, Aqel A, Al- Shagahin H. COVID-19 - knowledge, attitude and practice among medical and non-medical university students in Jordan J. Pure Appl Microbiol. (2020) 14:17–24. doi: 10.22207/JPAM.14.1.04

15. Clements JM. Knowledge Behaviors Toward COVID-19 Among U.S. Residents During the Early Days of the Pandemic. Available online at: https://www.medrxiv.org/content/10.1101/2020.03.31.20048967v1 (accessed April 8,2020). doi: 10.1101/2020.03.31.20048967

16. Zhong B, LuoW, Zhang QQ, Liu XG, LiWT, Li Y. Knowledge, attitudes, and practicestoward COVID-19 among Chinese residents during rapid rise period of COVID-19 outbreak: aquick online cross-sectional survey. Int J Biol Sci. (2020) 16:1745–52. doi: 10.7150/ijbs.45221

17. Erfani A, Shahriarirad R, Ranjbar K, Mirahmadizadeh A, Moghadami——M. Knowledge, attitude and practice toward the novel coronavirus (COVID-19) outbreak: A population-based survey in Iran. Bull World Health Organ (2020). Available online at: https://www.who.int/bulletin/ online_first/COVID-19/en/ (accessed April 8, 2020). doi: 10.2471/BLT.20. 256651

18. Bhagavathula AS, Aldhaleei WA, Rahmani J, Mahabadi MA, Bandari DK. Novel Coronavirus (COVID-19) Knowledge and Perceptions: A Survey of Healthcare Workers. (2020). Available online at: https://www.medrxiv.

org/content/10.1101/2020.03.09.20033381v2 (accessed April 8, 2020). doi: 10.1101/2020.03.09.20033381

19. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality ofadult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 020; published online March 9. http://dx.doi.org/10.1016/S0140-6736(20)30566-3

20. Ong SWX, Tan YK, Chia PY, Lee TH, Ng OT, Wong MSY, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic

21. patient. JAMA. (2020) 4:E1–E3. doi: 10.1001/jama.2020.3227

22. ECDC. COVID-19. (2020). Available online at: https://www.ecdc.europa.eu/en/covid-19-pandemic (accessed April 8, 2020).

23. WHO. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). (2020). Available online at: https://www.who.int/publicationsdetail/ report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19) (accessed May 7, 2020).

24. Grubaugh ND, Ladner JT, Lemey P, Pybus OG, Rambaut A, Holmes EC, et al. Tracking virus outbreaks in the twenty-first century. Nat Microbiol. (2019) 4:10–9. doi: 10.1038/s41564-018-0296-2.

Table 1. Demographic Variables with Level of knowledge score

Demographic variables		Level of knowledge score						N	%	Chi-square test
		Inadequate		Moderate		Adequate				
		N	(%)	N	(%)	N	(%)			
Gender	Male	84	(58.74%	48	33.57%	11	7.69%	143	25.54%	p=0.74(NS)
	Female	232	(55.64%	155	37.17%	30	7.19%	417	74.46%	
Age	< 20 years	133	(59.38%	81	36.16%	10	4.46%	224	40.00%	p=0.01**(S)
	21-30 years	82	(53.25%	58	37.66%	14	9.09%	154	27.50%	
	31-40 years	79	(61.72%	42	32.81%	7	5.47%	128	22.86%	
	>40 years	22	(40.74%	22	40.74%	10	18.52%	54	9.64%	
Educational qualification:	High school	25	(64.10%	13	33.33%	1	2.56%	39	6.96%	p=0.03*(S)
	Diploma	78	(60.00%	45	34.62%	7	5.38%	130	23.21%	
	Graduate	159	(53.54%	105	35.35%	33	11.11%	297	53.04%	
	Post Graduate	38	(59.38%	26	40.63%	0	0.00%	64	11.43%	
	Doctorate	16	(53.33%	14	46.67%	0	0.00%	30	5.36%	
Employment Status	Unemployed	0	(0.00%	6	100.00%	0	0.00%	6	1.07%	p=0.001***(S)
	Student	134	(57.51%	89	38.20%	10	4.29%	233	41.61%	
	Unskilled Worker	24	(70.59%	10	29.41%	0	0.00%	34	6.07%	
	Skilled Worker	105	(56.76%	58	31.35%	22	11.89%	185	33.04%	
	Professional	44	(56.41%	32	41.03%	2	2.56%	78	13.93%	
	Home Maker	9	(37.50%	8	33.33%	7	29.17%	24	4.29%	
Type of Family:	Nuclear family	224	(58.03%	131	33.94%	31	8.03%	386	68.93%	p=0.25(NS)
	Joint family	68	(53.97%	53	42.06%	5	3.97%	126	22.50%	
	Extended family	24	(50.00%	19	39.58%	5	10.42%	48	8.57%	

Place of living:	Rural	133	(59.38%)	71	31.70%	20	8.93%	224	40.00%	p=0.27(NS)
	Semi urban	86	(51.81%)	69	41.57%	11	6.63%	166	29.64%	
	Urban	97	(57.06%)	63	37.06%	10	5.88%	170	30.36%	
Marital Status:	Never married	100	(57.14%)	58	33.14%	17	9.71%	175	31.25%	p=0.26(NS)
	Ever married	216	(56.10%)	145	37.66%	24	6.23%	385	68.75%	
Monthly family income Rs:	Lower (<13,161)	28	(58.33%)	17	35.42%	3	6.25%	48	8.57%	p=0.001***(S)
	Upper Lower (13,161 - 19,758)	78	(60.47%)	44	34.11%	7	5.43%	129	23.04%	
	Lower Middle Class (19,759 - 26,354)	77	(47.53%)	60	37.04%	25	15.43%	162	28.93%	
	Upper Middle Class (26,355 - 52,733)	65	(54.62%)	53	44.54%	1	0.84%	119	21.25%	
	Upper Class (>52,734)	68	(66.67%)	29	28.43%	5	4.90%	102	18.21%	

Figure 1. text **Figure 1.** Pie chart representing knowledge level among the participants in COVID-19 related information
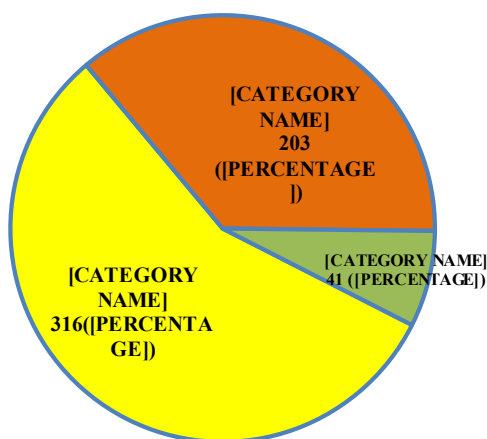

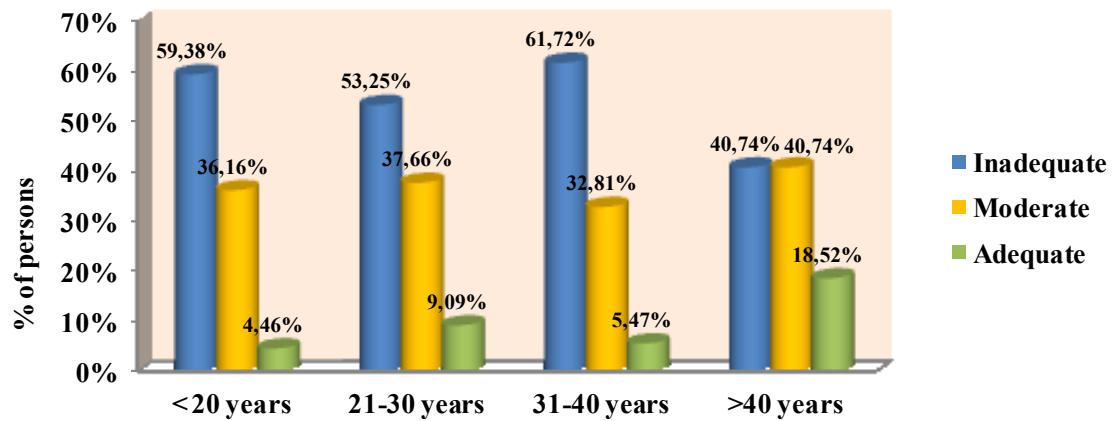**Figure 2.** Association between Knowledge Score and Age Category of the participants

Figure 3. Association between Knowledge Score and Educational qualification of the participants
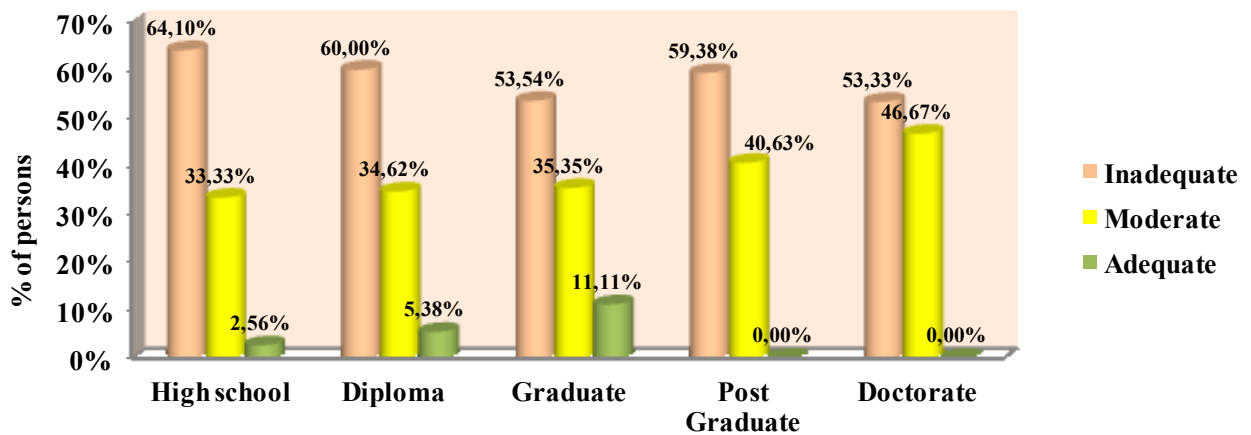
Figure 4. Association between Knowledge Score and Monthly Family Income of the participants